ESP SERIES

eyevis
PERFECT VISUAL SOLUTIONS

eyevis ESP Projectors with LED Projektions-Engine

User Manual

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eyevis User Manual
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About This Product

The new LED-lit DLP® projectors from eyevis share all the benefits of DLP® technology, just like conventional lamp-based projectors. In addition to that the LED-lit versions feature several advantages such as enhanced life-time fo the illumination technology, wider colour gamut and improved black-levels.

Standard input signal connection

- 1x DVI-D

Available types:

- ESP-LXT: with native XGA resolution 1024 x 768 px
- ESP-LSXT+: with native SXGA+ resolution 1400 x 1050 px
- ESP-LHD: with native full HD resolution 1920 x 1080 px
- ESP-LWXT: with native WUXGA resolution 1920 x 1200 px

About This Manual

Read and pay attention to this manual. It contains important information on the product. In particular, note all of the safety instructions and warnings.

Keep this manual in a safe place!

Warnings used

NOTICE
Indicates a hazard that could lead to **damage or destruction of the product**.

The general warning symbol indicates a hazard that could lead to **injuries or death**. In the text section, the general warning symbol is used in conjunction with the warning levels described below.

⚠ CAUTION
Indicates a hazard that could lead to **minor or moderate injuries**.

⚠ WARNING
Indicates a hazard that could lead to **death** or **serious injury**.

⚠ DANGER
Indicates a hazard that leads to **immediate death** or **serious injury**.

Symbols used

►	Indicates a single action or multiple actions which do not have to be performed in any specific order.
1. 2. 3.	Indicates a set of actions that have to be performed in a specific order.

Safety Instructions

In this chapter you will find general instructions for the safe handling of this product.

- ▶ Read this safety information thoroughly and follow all the instructions carefully.

In the following chapters, warning signs displayed in colour also indicate hazards that are imminent.

Intended use

The eyevis ESP projector with LED projection engine is intended for visually replaying contents.

- Only operate the product in a permitted position.
- Only use the product in dry rooms.
- Observe the permissible environmental conditions (see *Technical Specifications* on page 60.)

Operator qualifications

Installation and preliminary adjustments should only be performed by qualified service personnel or authorised service dealers.

General information

- ▶ Carefully observe all warnings on the system parts and in this user's manual.
- ▶ Carefully follow all the instructions governing the operation and use of our systems.
- ▶ Observe all the local system installation and operation regulations which our systems are subject to.

Power

- ▶ Only use the power cable supplied by eyevis.
- ▶ The power cable must be correctly and securely connected to earthed power outlets.
- ▶ Do not connect multiple devices to the same power outlet.
- ▶ Do not touch the power plug with wet hands when removing or plugging the plug into the outlet.
- ▶ Do not forcefully bend or pull the power plug and do not place any heavy material on it.
- ▶ Do not disconnect the power cable while using the product.
- ▶ To disconnect the device from the mains in an emergency, the plug must be pulled out from the mains socket. The mains plug must therefore be easily accessible at all times.
- ▶ Do not overload outlets and cables above their permissible capacity. Do not use impermissible extension cables.

- Do not install or operate the device under environmental conditions that deviate from the technical specifications. This mainly includes areas with constantly high humidity levels and in direct proximity to water, fire, radiators or ovens or exposed to direct sunlight or similar. Deviating operating conditions can lead to electric shocks, fire or can cause the device to crash.

Installation

- The devices should be installed professionally by your dealer.
- When unpacking or carrying the devices, at least two people are needed. Make sure the devices are carried upright.
- When installing the devices, use the designated frame supplied by eyevis. Use a special vibration absorbing frame from eyevis when using the devices in locations subject to vibration.
- Do not place the device in an unstable location such as e. g. inappropriate double-floors or inclines. Install on a horizontal, stable surface instead.
- Do not install the device in areas where the humidity or temperature is high. Information on permissible environmental conditions can be found in the *Technical Specifications* section on page 60.
- Do not place objects on the device and take appropriate measures to prevent the devices from falling down.
- Do not block the ventilation holes on the device.
- Always plug the power cable into the device before plugging it into the outlet and do not locate the device where persons may trip over the cable. If an extension cable is necessary, a cable with a current rating at least equal to that of the device should be used.

Use

- This device operates at high voltages. Never repair, modify or disassemble the device by yourself.
- Do not insert any objects into the device.
- If there is thunder or lightning, do not touch the device, cable or power plug.
- Do not climb onto or stand on the device.
- If the device will not be used for a long period of time, remove the power plug from the wall outlet for safety.
- Do not operate the device with a damaged cable or if the device has been dropped or damaged until it has been examined by a qualified service technician.
- **Caution:** Some parts of the device may become hot during operation.

Disassembly and storage

- Let the device cool down completely before storing.
- Disconnect the power cable and all other cables before moving or disassembling the device. Remove the power plug by pulling the plug (and not the cable) out of the outlet.
- Pack the device into the original packaging to ensure the best possible storage for the device.
- Observe the environmental conditions for storage in the section *Technical Specifications* section on page 60.

Disclaimer

- eyevis is not liable for any damage caused by natural disaster (such as earthquake, thunder etc.), fires, acts by third parties, accidents, owner's intentional misuse and fault or uses in other improper conditions.
- eyevis is not liable for incidental damages such as profit loss or interruption in business, data modification or data deletion caused by the use of eyevis products or their operation failure.
- eyevis is not liable for any damage caused by non-adherence to the instructions described in the user manual.
- eyevis is not liable for any damage caused by using its products in conjunction with other products, systems and software.
- eyevis is not liable for any damage caused by the improper installation of its products.

Conformity

This device complies with the following directives from the European Union:

- EMC Directive 2004/108/EC

  This device complies with Category A requirements. It can cause electromagnetic interference (EMI) when used in residential areas. The owner may be forced to take suitable measures to prevent EMI emissions at his/her own expense.
- Low-Voltage Directive 2006/95/EC
- 2002/95/EC (as of January 27, 2003, Directive of the European Parliament and the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS))
- 2002/96/EC (as of January 27, 2003, Directive from the European Parliament and the Council on waste electrical and electronic equipment (WEEE)).

CE

The compliance with the requirements is certified with the CE symbol labelled on the product.

The manufacturer cannot be held liable for the operation of the device outside the operating conditions as described in this user's manual. Any improper operation will also void your product liability and warranty claims.

Batteries

- If the batteries are not exchanged properly, there is a risk of explosion. Only replace the batteries with the same type or with a similar type recommended by the battery manufacturer.
- When disposing of used batteries, please observe the legal regulations and environmental protection directives valid for the specific country/region.
- Do not expose the batteries to excess heat and do not throw the batteries into fire.
- Do not attempt to recharge or to open the batteries. The batteries could either leak or explode.

Transport, Storage, Unpacking

Unpacking

The projector is packaged in a cardboard box. To protect the projector during transportation, the projector is wrapped in foam. The packaging is secured with packing tape.

To unpack the projector:

1. Open the package
2. Remove the projector with the protection foam from the package.
3. Remove the protection foam.

Storage of packaging

► Store the original packaging in a safe place. It is the ideal packaging for sending or storing the devices.

Delivery Contents

Dimensions and technical details may vary depending on the product version.

Packaging

Projector

- ESP-LYY (ready mounted)
- 1 power cable
- 1 RS-232 serial cable
- 1 DVI Cable (1 meter)
- 1 eyevis projector adjustment software on CD
- User Manual

Product Overview

This section provides an overview of the entire product, the individual parts as well as the connection and adjustment elements.

Projector

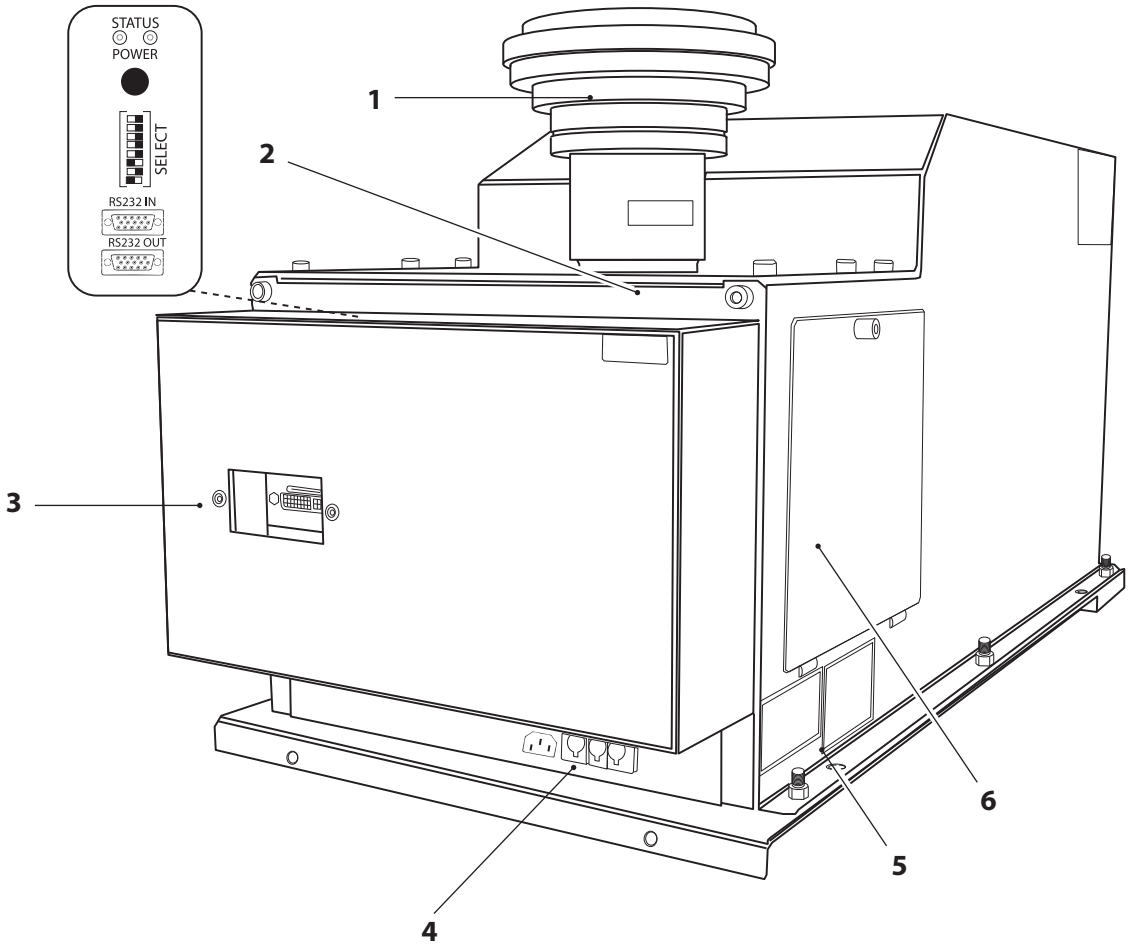
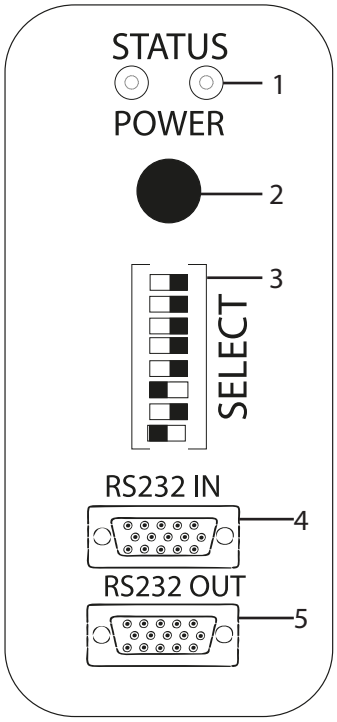


Fig. 1: Front view of projector

1	Optics
2	Service cover for focus adjustment
3	DVI IN from input box
4	Main power engine - shield - protection
5	Serial number of projector
6	Service cover

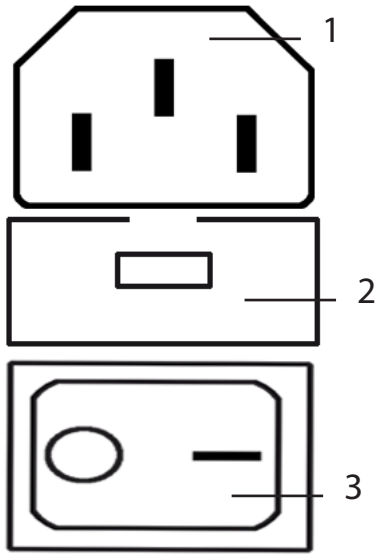
Control module



1	LEDs display status
2	Powerbutton (On / Off)
3	DIP-switcher
4	VGA (RS232 IN)
5	VGA (RS232 OUT)

Fig. 2: Vorderansicht des Bedienfeldes

Power Supply



1	Power Supply
2	Protection
3	Main switcher On / Off

Fig. 3: Power Supply

Assembly / Installation

This section describes how to mount and install the projector.

Authorized installation options

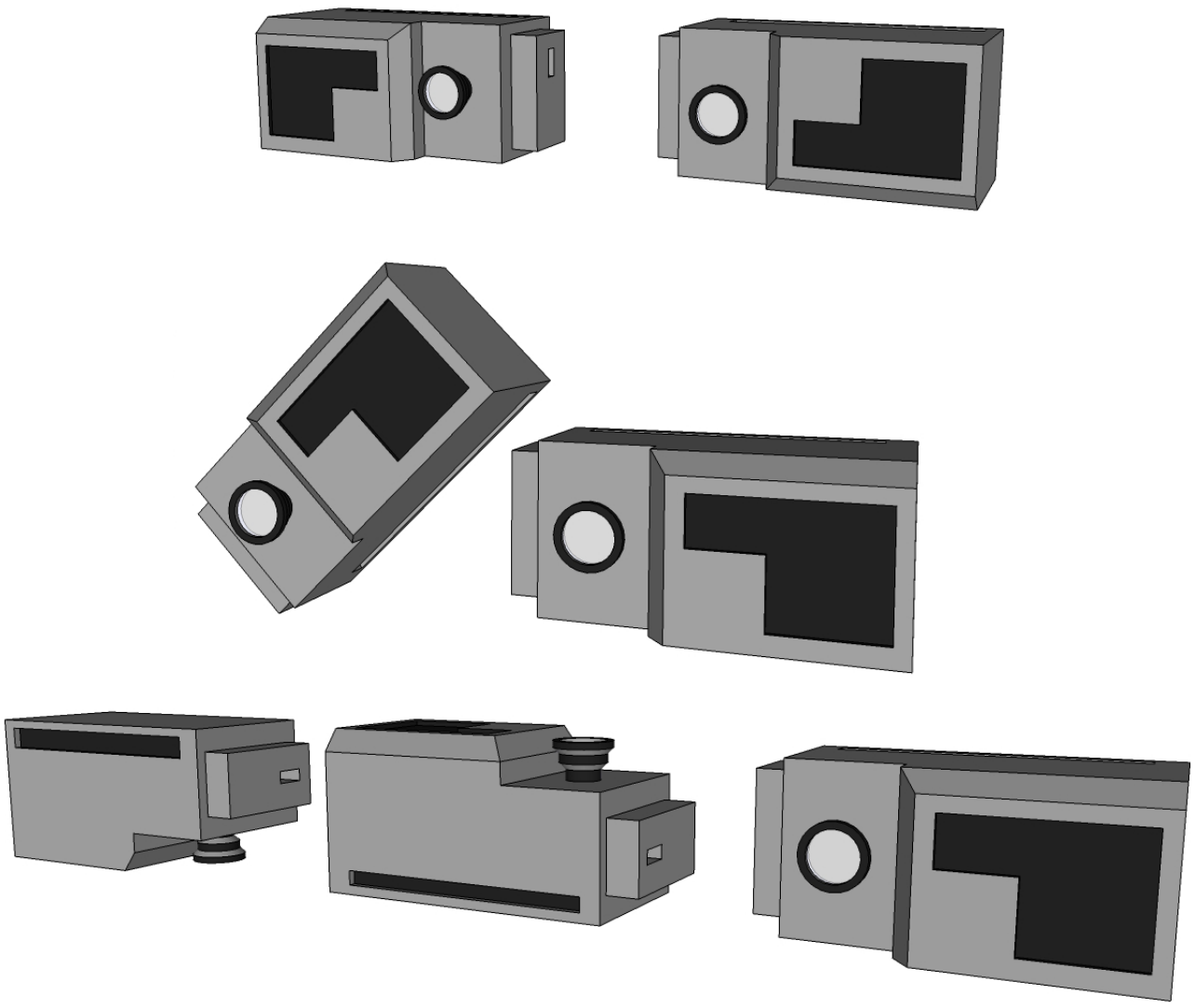


Fig. 4: Authorized installation option

Unauthorized installation options

In the following position shows the cooling element of the projector down. In this position, a sufficient cooling performance can not be guaranteed.

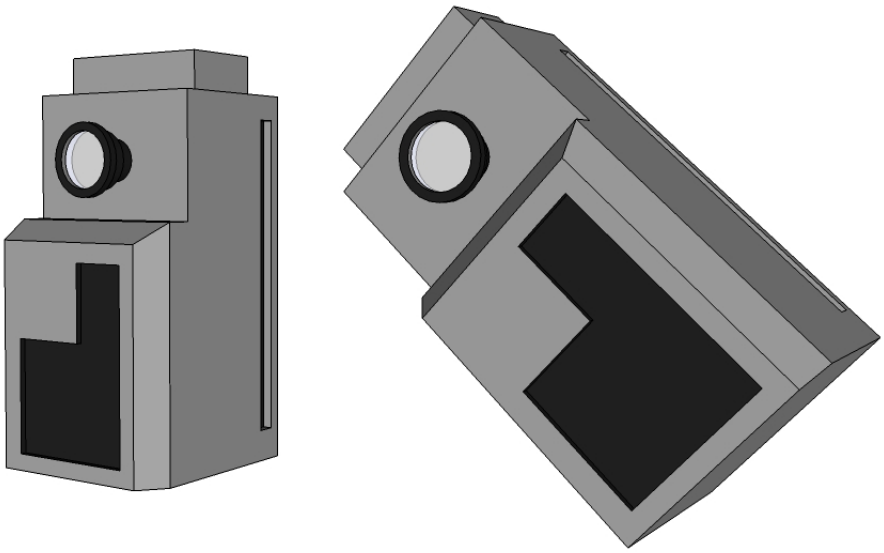


Fig. 5: Unauthorized installation options/ EInbaulagen

Cabling the projectors

The projectors are connected together via RS232 cables.

) **NOTE:**
The RS232 cable is a 9-pin D-sub extension cable with 1:1 wiring.

To cable the projectors together:

Use the RS232 data cable provided (9-pin D-sub 1:1 extension cable) and connect each RS232 OUT to RS232 IN. Proceed according to the following diagram:

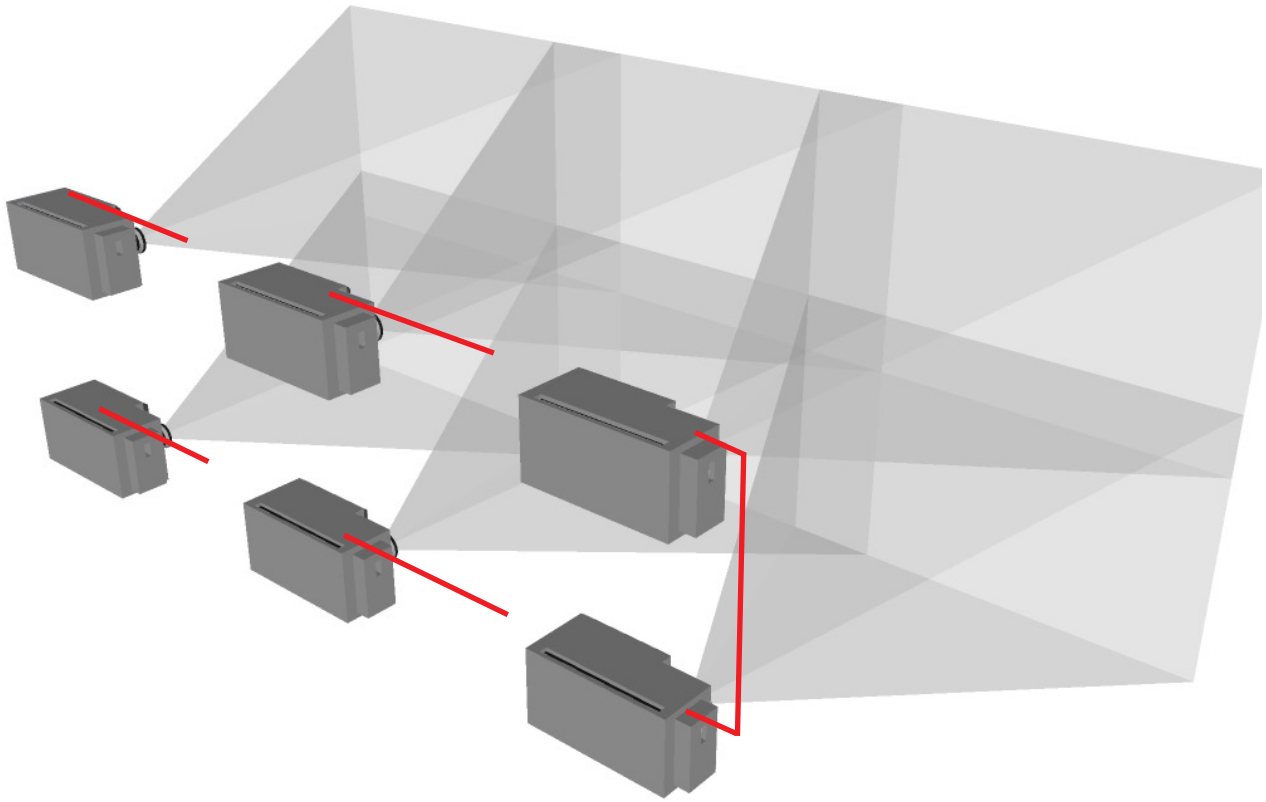


Fig. 6: Unauthorized installation options/ EInbaulagen

To connect the projectors to the control PC:

- Connect the control PC to projector 1 either via a RS232 data cable or via a KAT.5 Ethernet cable (optional):

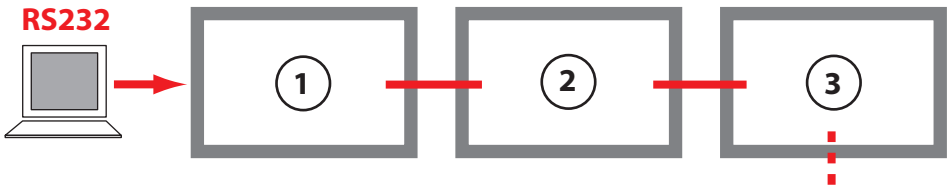


Fig. 7: Connecting the projecotrs to the control PC

Adressing the projectors

To control the projectors and to enable communication, each projector must be allocated with an individual address. The projectors are addressed with consecutive numbers.

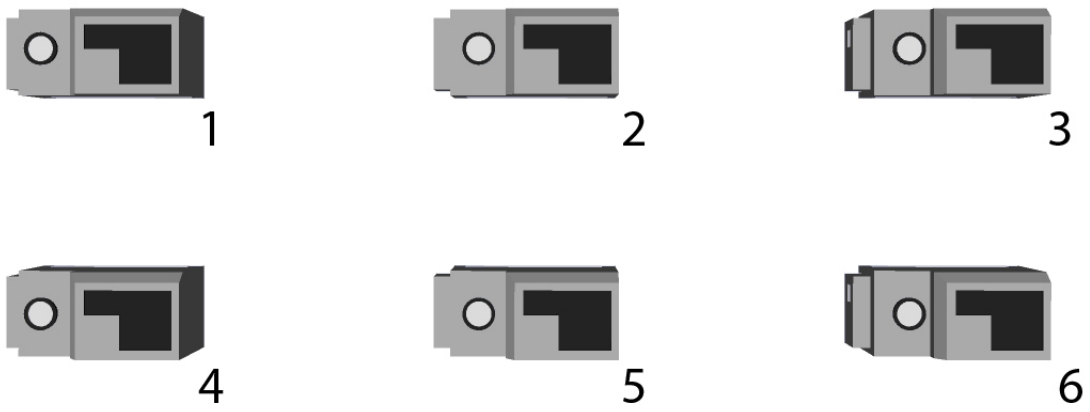


Fig. 8: Adressing the projecotrs

DIP Switches

Setting of projector address for serial connection

Adresse	DIP 1	DIP 2	DIP 3	DIP 4	DIP 5	DIP 6
1	1	0	0	0	0	0
2	0	1	0	0	0	0
3	1	1	0	0	0	0
4	0	0	1	0	0	0
...						
9	1	0	0	1	0	0
...						

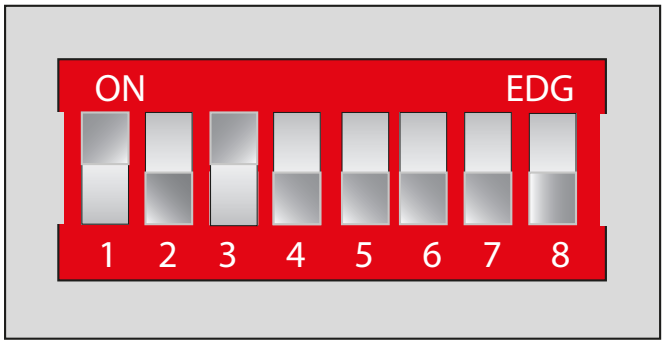


Fig. 9: DIP switches

Adjusting the focus

In order to achieve a clear image, it is necessary to adjust the optical focus of the projection engine. In the event that the image on the screen becomes blurred, it is necessary to readjust the focus setting. To adjust the focus, we recommend using an image with suitable content displayed on the screen, e. g. an image with writing in all corners or something similar. You can find appropriate test images on your eyeDevice software CD.<GT><GT>

To adjust the focus:

1. Remove the four screws that secure the left part of the cover to the focus.
2. Removce the cover.
   ↳ You can now access the inside of the projector.
3. Loosen the adjustment screws.
   ↳ SYou can now adjust the focus of the lens by turning the adjustment screw to the left or right.
4. Secure the adjustment screw again in its position once you have made the setting.
5. Close the cover on the projector again using the four screws.

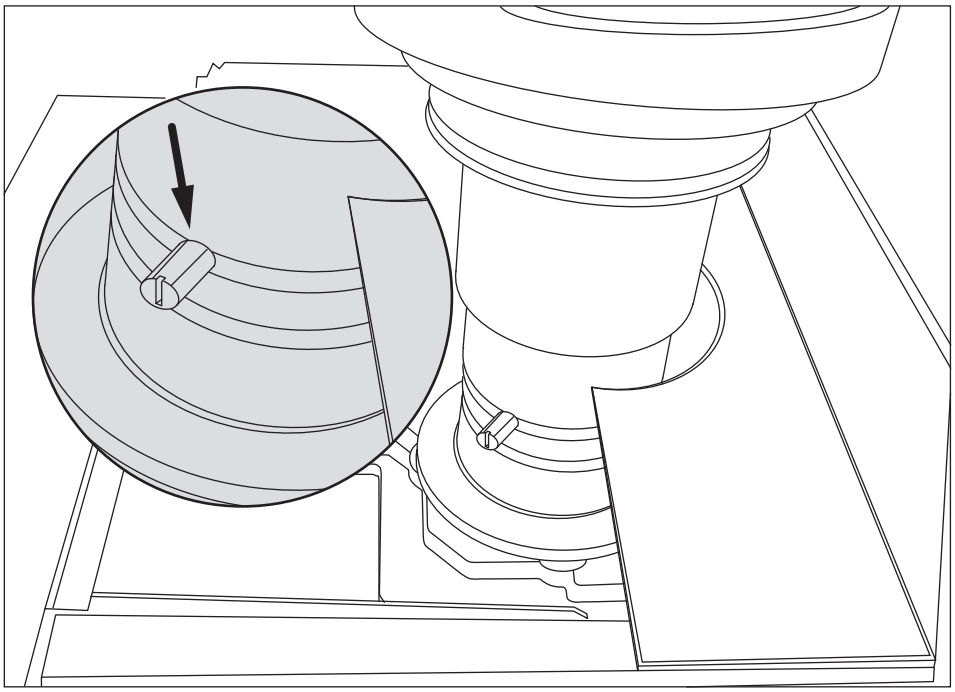


Fig. 10: Focus setting on the projector

Configuration

The projectors have to be configured before they can be commissioned. Two programs are available to help you configure the projectors: eyeDevice software and EC-Lcontrol. Both programs are stored on the CD provided.

General information on the configuration programs

Both programs for configuring the projectors are used to perform different tasks:

EC-Lcontrol:
- Colour adjustment

eyeDevice software:
- Communication between PC and Projector
- Adjustment of colour (with EC-Lcontrol) and geometry
- Status query of projectors
- Gamma adjustment (with EC-Lcontrol)
- Generating reports

> **NOTE:**
> The EC-Lcontrol program is specially developed for adjusting the colour of the eyevis ESP projectors. For this reason, use this program for colour adjustments instead of the colour adjustment function in the eyeDevice software.

Program installation and start

The programs do not have to be installed.

1. Simply copy the entire program folder to the desired location you wish on your PC (usually C:\Programs).
2. Open the relevant exe file to launch the programs.

Intelligent user interface

Once the connection to the projectors has been established, the programs detect which parts are connected and display the relevant functions on the user interface. The setting parameters are read out from the projectors and displayed in the program windows. Any changes to the settings are saved in the projectors or can be stored in a configuration file on the PC.

Adjusting the colours with EC-Lcontrol

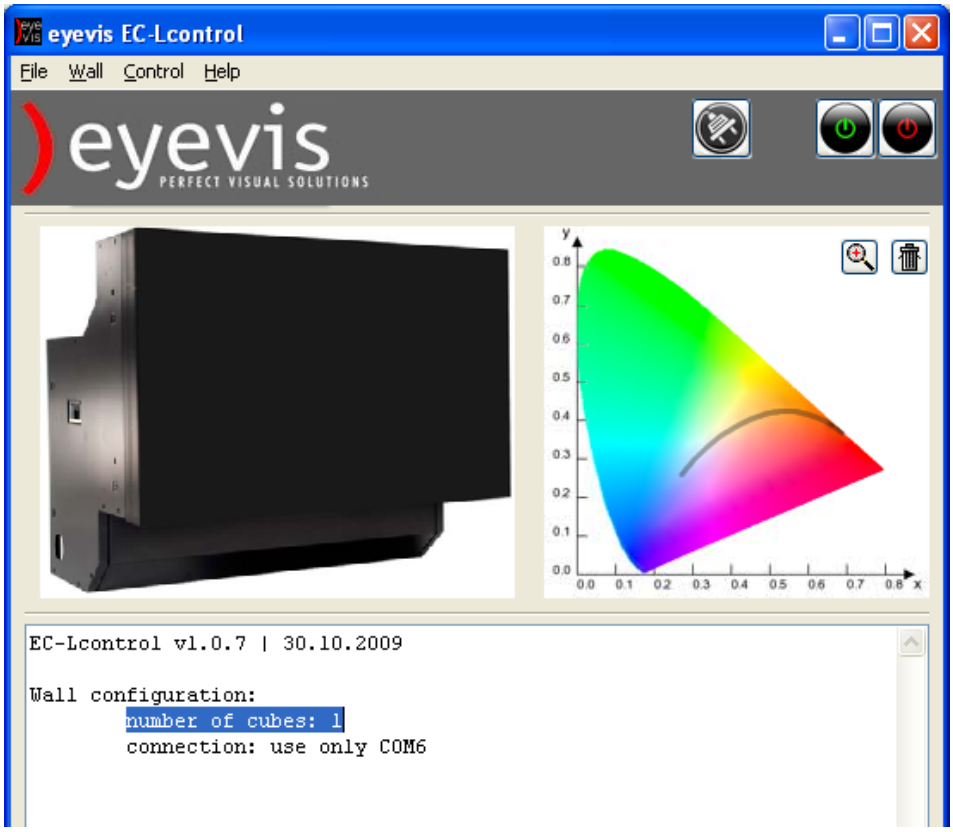
EC_Lcontrol.exe

This section describes how to adjust colours using the "EC-Lcontrol" program.

A detailed description of the program can be found in *The EC-Lcontrol Software* section from page 47.

To start the program:

► Launch the EC-Lcontrol software (EC-Lcontrol.exe).
↳ The start window opens.



3.

) **NOTE:**
The EC-LControl software can be used for both ESP eyevis projectors and for the eyevisCube series. Therefore, both the concepts of CUBE and projector are used.

(In the software and in the text)

Adjusting the connection parameters

1. Select the **Wall** menu and open **Wall Setup**.
   ↳ The connection parameters window opens.

2. Select the COM port to which the first projector is connected.

You now have two options to select which projectors you want to adjust:

- Manual input of the first and last projector
- Automatic projector recognition

To enter the first and last projectors manually:

► Enter the ID numbers of the first and last projector.

Example: If you want to adjust all projectors on a wall with 4 x 2 projectors: serial ID start = 1, ID end = 8

To automatically detect the projectors:

1. Select the scan option in the **Serial port** field:
   a. **Use only selected serial port:** Only the COM port selected in the top selection box is scanned.
   b. **Scan all available serial ports:** All COM ports are scanned.
2. Click the **(Connect with wall)** button.
   ↳ The number of projectors found as well as the IDs of the first and last projectors are displayed.
3. You can now change the IDs.

Adjusting the colours

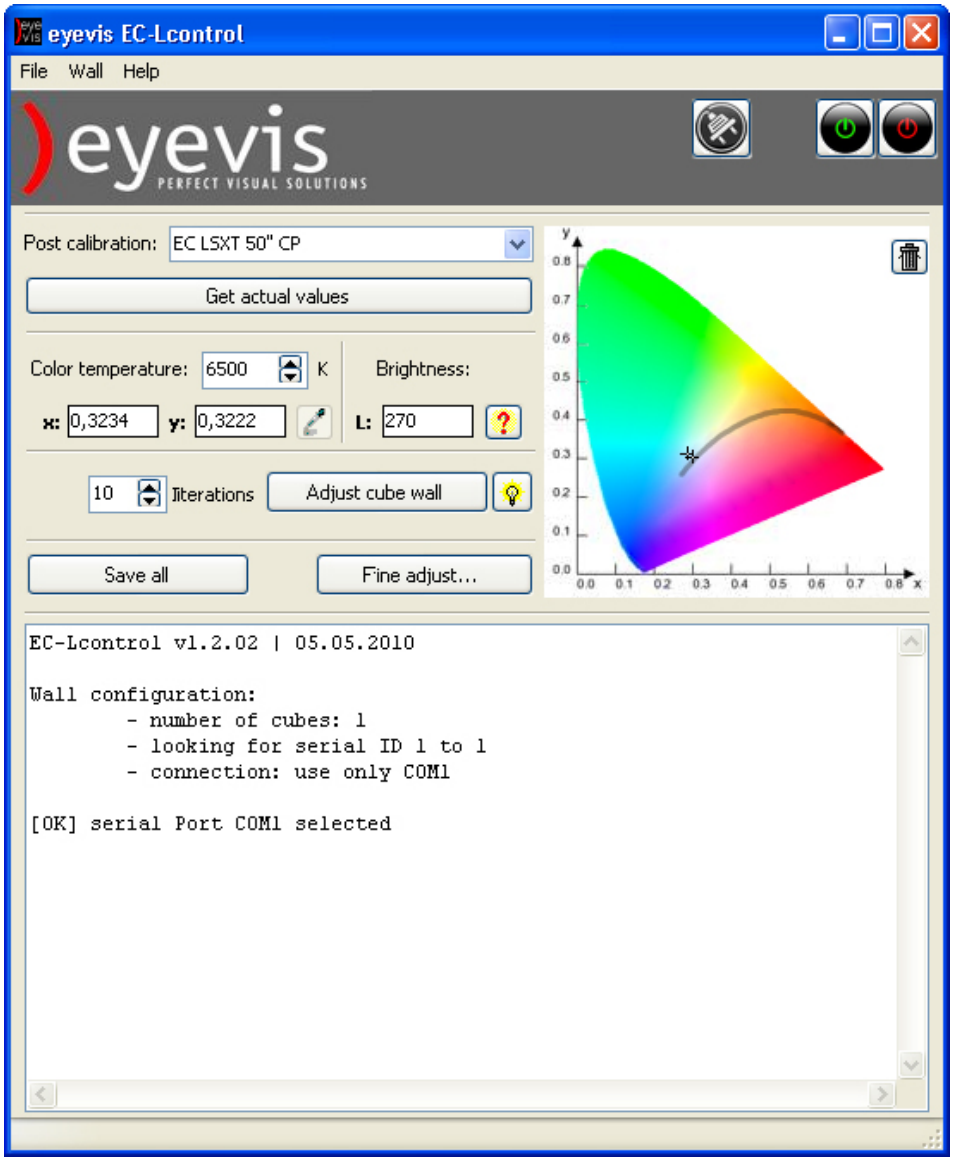


Fig. 11: The EC-Lcontrol start window

> **NOTE:**
> The settings you change will be applied to all projectors that you previously selected (Serial ID start, Serial ID end).

To display the current settings:

- Press the **Get actual values** button.
  - The current projector settings are displayed in the status window.

To manually adjust the projectors:

1. Select the colour you wish from the **Colour temperature** field.
   ↳ Information on the colour temperatures can be found in *Tab. 1 on page 53*.
2. Adjust the brightness in the **Brightness** field.
   ↳ The brightness can be estimated from the values contained in the list for each projector.
3. Click on **Adjust cube wall** to apply the settings.
   ↳ The current settings will be displayed in the lower part of the window and illustrated in the colour diagram.
   ↳ The displayed images on the video wall change at the same time.

To adjust the projectors to the maximum brightness:

This function can be used to adjust the projectors to the maximum brightness regardless of a specific colour temperature.

► Press the button to adjust all projectors to the maximum brightness.

To automatically adjust the projectors:

This function is used to automatically calculate the correct set value for both colour and brightness. The software then applies this set value to define a standard colour and brightness for all projectors. The current values of each projector are used to calculate the set value for x and y as well as the brightness. (Note: If the maximum brightness has been set as described above, the current value is the maximum value.) This process is not dependent on a specific colour temperature. A set value that allows the maximum brightness is used.

1. Press the button to get the values recommended by the software.
   ↳ The current settings are displayed in the lower part of the window.
   ↳ The values are automatically entered in the entry fields. The suggested values are calculated by the software to achieve the optimal setting for all projectors.
   ↳ The brightness of the projectors can be reduced during the colour settings in order to achieve an optimal colour representation.
2. Press the **Adjust cube wall** button.
   ↳ The wall is adjusted to the maximum attainable values.

► If you are not satisfied with the result, you will need to adjust the colour temperature and brightness again. Refer to the following section on how to optimise the “whitepoint”.

To optimise the whitepoint:

Example: The wall appears blue on the master display but the desk monitors appear red. In this scenario, instead of setting the maximum brightness, it is more beneficial to find a better whitepoint.

► Select a colour temperature from the list of set values and click on the **Adjust projector wall** button.
   ↳ The table below shows a text output of two projectors which were set to a colour temperature of 3500 K.

Text output in display field	Notes
2010_07_21 13:09:46 adjust whitepoint.... iteration: 1 of 10 iteration: 2 of 10 [ERR] Cube_2 RED-OVERRUN iteration: 3 of 10 [ERR] Cube_2 RED-OVERRUN iteration: 4 of 10 iteration: 5 of 10 iteration: 6 of 10 iteration: 7 of 10 iteration: 8 of 10 iteration: 9 of 10 iteration: 10 of 10 ==========	Iteration steps for optimisation The error messages indicate that the red LED cannot be set to an adequate brightness setting to achieve the selected colour temperature. The brightness of the other colours must therefore be reduced accordingly.
LED capacity: cube R G B 1 83% 35% 25% 2 98% 38% 27% ---------- max: 98% 38% 27% cube: #2 #2 #2 ---------- min: 83% 35% 25% cube: #1 #1 #1 ---------- mean: 90% 36% 26% ==========	**LED capacity** displays the control of the LEDs of projector 1 and 2. The high capacity of the red LED (R) can be clearly identified.
chromatic deviation: cube x y L 1: -0.0001 0.0004 0.4834 2: -0.0026 -0.0022 0.6407 ==========	Chromatic deviation
actual color values: cube x y L dx dy dL temp 1 0.4125 0.382 99.4 0.0008 0.0002 0.6 31° 2 0.411 0.3827 99.9 0.0007 0.0005 0.1 32° ==========	Actual colour values
accuracy: x y L 0.0008 0.0003 0.3 done!	Accuracy

These values can be used to manually select the default brightness (see page 40/41) If the maximum capacity of the LEDs is set to just 60%, a higher brightness default value can be selected.

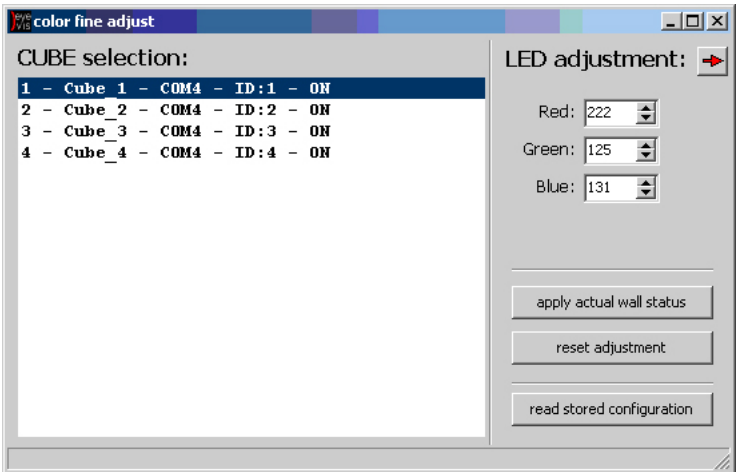
► If you are satisfied with the result, proceed to the next step to perform fine adjustments.<GT>

Fine adjustment for selected projectors

Fine differences in colour rendering and brightness between the projectors can be adjusted with the fine adjustment function.

To open the fine adjustment function:

1. Click on the **Fine adjust...** button.
   ↳ The **Color fine adjust** window opens.


color fine adjust
CUBE selection:
1 - Cube_1 - COM4 - ID:1 - ON
2 - Cube_2 - COM4 - ID:2 - ON
3 - Cube_3 - COM4 - ID:3 - ON
4 - Cube_4 - COM4 - ID:4 - ON
LED adjustment:
Red: 222
Green: 125
Blue: 131
apply actual wall status
reset adjustment
read stored configuration

2. Select a projector and adjust the RGB values until a harmonious colour rendering is achieved for the entire wall.
   ↳ As soon as you change the RGB values, the **Reset** button appears underneath the RGB boxes. Click on **Reset** to reset the changes.
3. Click on **Apply actual wall status**.
   ↳ It takes a few seconds to apply the changes.
4. Close the window if you are satisfied with the result.
   ↳ The start window opens again.
5. Click on **Save All** to save the settings in all projectors.

You have now completed the colour settings.

1. Select the projector you want from the list in the left-hand field.
2. Click on the button to apply the changes for the selected projector only.

You have the following input options:

- Drag the whitepoint across the colour field
- Direct input of RGB values
- Direct input of CIE values

Drag the whitepoint across the colour field:

1. Use the arrow buttons in the colour space to shift the whitepoint in the direction you want.
   ↳ The effects on the x, y and L values are displayed simultaneously.
2. Click on **Adjust** to transfer the settings to the selected projector.

Enter the RGB values:

1. Manually enter the values for red, green and blue.
2. Transfer the values into the CIE area by proceeding as follows:
   a. Checkmark the boxes for x, y and L to determine which values should be changed.
   b. Click on the button to apply the settings for all projectors.
   c. Click on the button to apply the changes for the selected projector.
3. Click on **Adjust** to transfer the settings to the selected projector.

Enter the CIE values:

1. Manually enter the values for **CIE x**, **CIE y** and **L**.
2. Click on **Adjust** to transfer the settings to the selected projector.

Complete the entry and then save:

1. Close the **Color fine adjust** window.
2. Press the **Save all** button in the main menu window.

Establishing communication via eyeDevice

eyeCube.exe

This section describes how to establish the communication with the projectors with the help of the eyeDevice software.

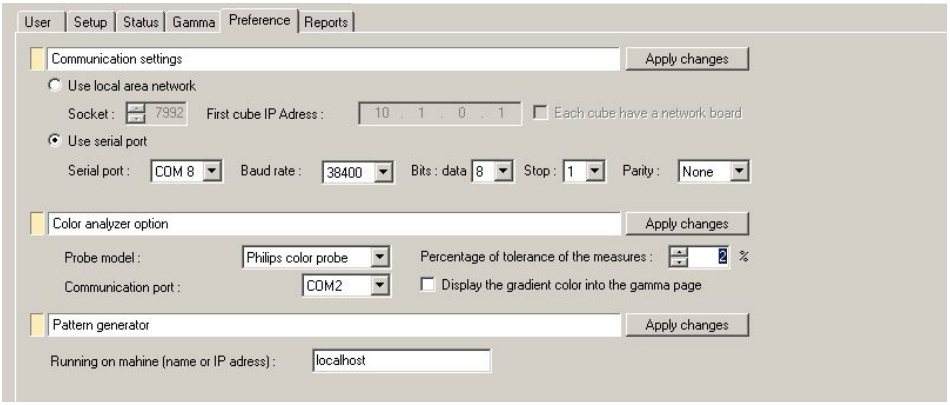
A detailed description can be found in *The eyeDevice Software* section from page 38 onwards.

To start the eyeDevice software:

1. Open the eyeDevice software (eyeDEVICE.exe).
2. Confirm with **OK** without entering a password. You do not need administrator rights for the following steps.

Establishing communication

► Open the **Preference** page.
  ↳ The serial connection via RS232 interface **(Use serial port)** is selected as standard.



To use the serial port:

1. In the **Serial Port** entry field, select the COM port to which the video wall is connected.
2. For the remaining settings, the standard values should match the ones displayed in the screenshot.
3. Press **Apply changes** to apply the new settings.
  ↳ You can check if the connection is active on the Reports page.

To establish a connection via Ethernet (optional):

✓ A connection is established to the first projector via the Ethernet cable.

1. Select **Use local area network**.
2. Enter the IP address to the connected projector (the first projector).
3. For the remaining settings, the standard values should match the ones displayed in the screenshot.
4. Press **Apply changes** to apply the new settings.
  ↳ You can check if the connection is active on the **Reports** page.

Selecting the colour sensor interface (Color analyzer option)

) **NOTE:**
An automatic colour sensor enables the projector settings with the UHP lamp. This function is not required with LED projects.

Using the Pattern generator

) **NOTE:**
The pattern generator tests the entire colour spectrum from 100% (white) to 0% (black). Greyscales and individual colours can also be checked. The pattern generator is required with lamp projectors to ensure homogeneity over the entire wall.

Even though the pattern generator is not required for configuring LED projectors, it is useful for checking different greyscales and the homogeneity on the video wall.

To use the pattern generator:

✓ The eyePattern program first has to be installed on the source PC.

✓ An Ethernet connection must also be established between the source PC and control PC.

1. Open the software on the source PC.
2. Enter the name or the IP address of the source PC in the **Running on machine** field.
3. Press **Apply changes** to apply the new settings.
   ↳ You can check if the connection is active on the **Reports** page.

Entering the wall size

In the **Wall size** field, you can enter the number and layout of the projectors:

1. In the first window, select the number of columns, which is 4 in the example above.
2. In the second window, select the number of rows, which is 2 in the example above.

Reading the configurations

1. Mark the projector you want in the wall view. You can select several projectors at once: Click and hold the left mouse button in a field and mark the relevant area.
2. Click on **Read current...**
   ↳ The data of the selected projectors are displayed in the view window.

Other settings

Detailed information on other setting options can be found in *The eyeDevice Software* section from page 38 onwards.

Saving the configuration

Once you have adjusted all the settings, you can save the configuration in a file on the PC.

1. Click on **Write...**.
2. Select the target location and file name and click on **OK**.

Activating the internal Automatic Color Tracking

Once you have finished the colour adjustment with the EC-Lcontrol software, you have to activate the internal Automatic Color Tracking function. This step is performed in the eyeDevice software.

) **NOTE:**
ACT (Automatic Color Tracking) is available in two versions:

- **ACT*intern* is available as a setting in eyeDevice:**
  The projector-internal Automatic Color Tracking function is activated in the eyeDevice software via ACT*intern*. This function simply tracks the colours on each individual projector without comparing the projector in a combined projection.
- **ACT*extern* and Communication Box:**
  ACT*extern* comprises the ACT software and the Communication Box. In contrast to ACT*intern,* ACT*extern* constantly compares the colour settings of all projectors on one wall and adjusts the colours, if necessary, to achieve a harmonious colour rendering. The Communication Box can be connected to the projectors via a serial interface or LAN. Besides controlling the projectors, ACT*extern* also generates detailed log files and can check the temperatures of each projector over time. It is also possible to connect external temperature sensors to ACT*extern*.

To activate ACT*intern* in eyeDevice:

1. Open the eyeDevice software.
2. Open the **Setup** page.
3. Select the reference value for automatic colour tracking:
   Open **Projector Setup/Act_Reference** and click on **Set**.
4. Set the colour adjustment setting to Internal.
   Open **Projector Setup/Act_Control** and select the **Internal** setting.
5. Press the **Save all...** button to save the current settings.
6. Repeat the same steps for each projector.

To use ACT*extern* with the Communication Box:

► Please observe the information in the Communication Box manual.

OPERATION

NOTICE

Shocks and vibrations

Strong shocks and vibrations can damage the projector.

► Protect the projectors from heavy shocks and impacts.

) **NOTE:**

- The projector is suitable for use in motion simulators.
- The limits for use in moving environments can be requested if necessary.

NOTICE

Switching on the projector after a power failure

Switching on the projectors immediately after a power failure can damage the projectors.

► Wait at least 30 seconds after a power failure before restarting the projectors.

Malfunctions and Troubleshooting

Before calling your service partner, please check the following table for a possible cause to the trouble you are currently experiencing.

NOTE:
The devices may only be opened by specially trained and qualified personnel.

Typical problems

No picture

- Make sure that the power cable is plugged in.
- Check if the projector's power is OFF or if the projector is in standby mode.
- Check that the auxiliary equipment is connected properly.
- Check if the input setting is correct.
- Check that the signal is suitable.

The projector does not start up

- Check the cable connections between the projector and power outlet.

Blurred picture

- Check the focus adjustment of the projector.

No communication between control PC and projector

- Check that you have selected the right COM port.
- Check the COM port settings.
- Check the serial cable connection for communication.

Possible causes of malfunctions and problems

⚠ CAUTION

Smoke or peculiar smells

If you continue to use the device when smoke or peculiar smells are coming from the projector housing, it may cause a fire or an electric shock.

- ▶ Immediately remove the power plug from the outlet.
- ▶ Make sure that the device is not smouldering inside and this is going unnoticed.
- ▶ Contact your dealer for inspection.

⚠ CAUTION

Liquids or objects inside the device

If you continue to use the device after water, other fluids or objects have been spilled or dropped, this may cause a fire or an electric shock.

- ▶ Immediately remove the power plug from the outlet.
- ▶ Contact your dealer for inspection.

⚠ CAUTION

Damage caused by dropping the device

If you continue to use the device after it has been dropped or the housing has been damaged, it may cause a fire or an electric shock.

- ▶ Immediately remove the power plug from the outlet.
- ▶ Contact your dealer for inspection.

⚠ CAUTION

Damaged or hot power cable

If you continue to use the device even though the power cable is damaged or becomes hot, it may cause a fire or an electric shock.

- ▶ Immediately remove the power plug from the outlet.
- ▶ Contact your dealer for inspection.

Cleaning and Care

This section describes how to clean the device. Regular and proper cleaning helps to maintain the quality of this device and to protect it from damage.

⚠ WARNING

Dangerous electric voltage inside the device

Cleaning the device while connected to the power supply can result in death, severe injury or can damage the device.

- ► Always unplug the device from the electrical outlet before cleaning it.
- ► Never yank at the cable to pull the plug from the outlet. Take hold of the plug and pull to disconnect.
- ► Do not spill any fluids inside the device.

Cleaning intervals

How often you clean the device primarily depends on the environmental conditions.

- ► Clean the device if dust has collected on the housing.
- ► Contact your dealer for internal cleaning once a year.

Cleaning the housing

NOTICE

Unsuitable cleaning substances

Strong cleaning substances such as thinners, benzene or abrasive cleaners can damage the housing.

- ► Never use liquid cleaners or cleaning sprays. Use a damp cloth for cleaning.

- ► Wipe the housing over regularly with a soft cloth to keep it clean. Small stains can be removed using a damp cloth and a small amount of mild detergent.

Disassembly and disposal

This device was made almost exclusively from material that can be disposed of and recycled in an environmentally friendly manner. Once the device is removed from operation eyevis will take it back to promote the reuse or recycling of material resources, provided the device is returned in a condition that reflects use as intended. Non-recyclable device parts are disposed of correctly.

The packaging and packing aids can be recycled and are intended for reuse.

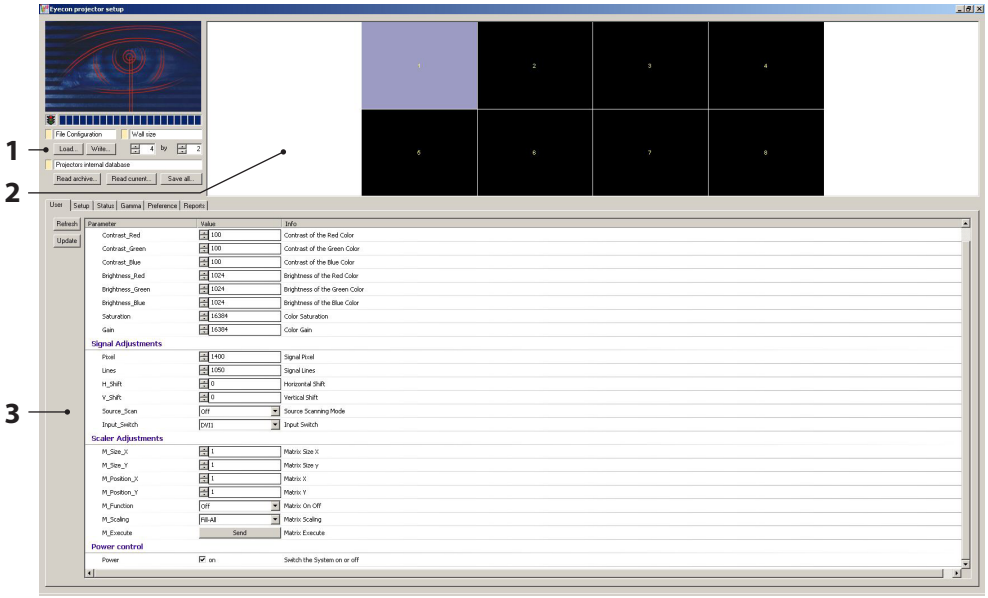
The eyeDevice Software

eyeCube.exe

eyevis has developed the eyeDevice software for setting the projectors and for colour adjustment. The eyeDevice software provides all the necessary functions for adjusting the colours, brightness and contrast of the projectors. The EC-Lcontrol program is used in conjunction with the ESP projectors for colour adjustment. However, all other settings are programmed with the eyeDevice software.

Starting the eyeDevice software

1. Open the eyeDevice software to configure your video wall.
   - Two types of users are available:
   a. **Administrator:** This type is intended for advanced, trained personnel. The password required is available from the eyevis service. Enter the password and confirm with **OK**.
   b. **User:** This is the normal user type (no service settings are possible). Confirm with **OK** without entering a password.
   - Once the program has been launched, the program interface is displayed:



The interface is divided into three areas:

1	**Load/Save area** To load and save configurations and set the video wall size.
2	**Selection area** To display the video wall with the prjectors. The currently active projector is highlighted.
3	**Parameter area** Windows with parameters that can be selected with tabs.

The Load/Save area

In this area of the window, you can load and save configurations as well as determine the size of the video wall.

File Configuration	**Load**	Loads a configuration file saved on the PC (for example the saved file of the first system configuration).
	Write	Saves a configuration file with the current settings on the PC.
Wall Size		Enters the size of the wall: • First number: number of vertical columns • Second number: number of horizontal rows
Projectors internal database	**Read default**	Reads the default settings of the active projector. The factory projector settings can thus be restored at any time.
	Read current	Reads the current settings of the active projector. The settings are then displayed in the parameter area.
	Save all	Saves all the current settings in the projector.

The selection area

A preview of your projection configuration appears in this part of the screen. A single projector can be selected with the mouse to adjust the settings. If a projector is selected, the current settings can be read by clicking on the **Read current** button.

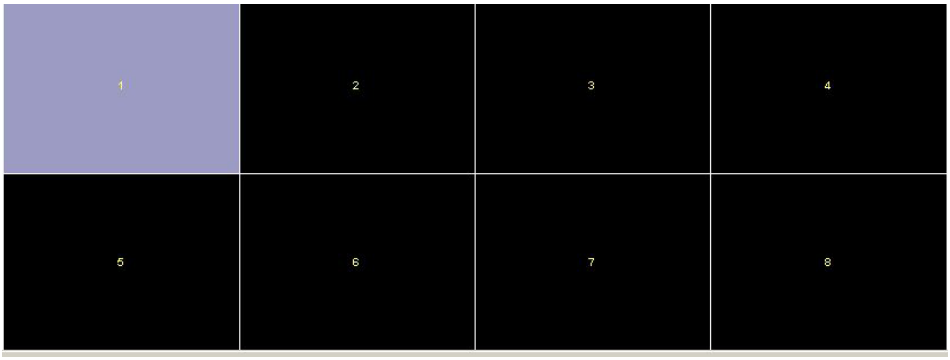


Fig. 12: Visualising the projection wall with 4 x 2 projectors

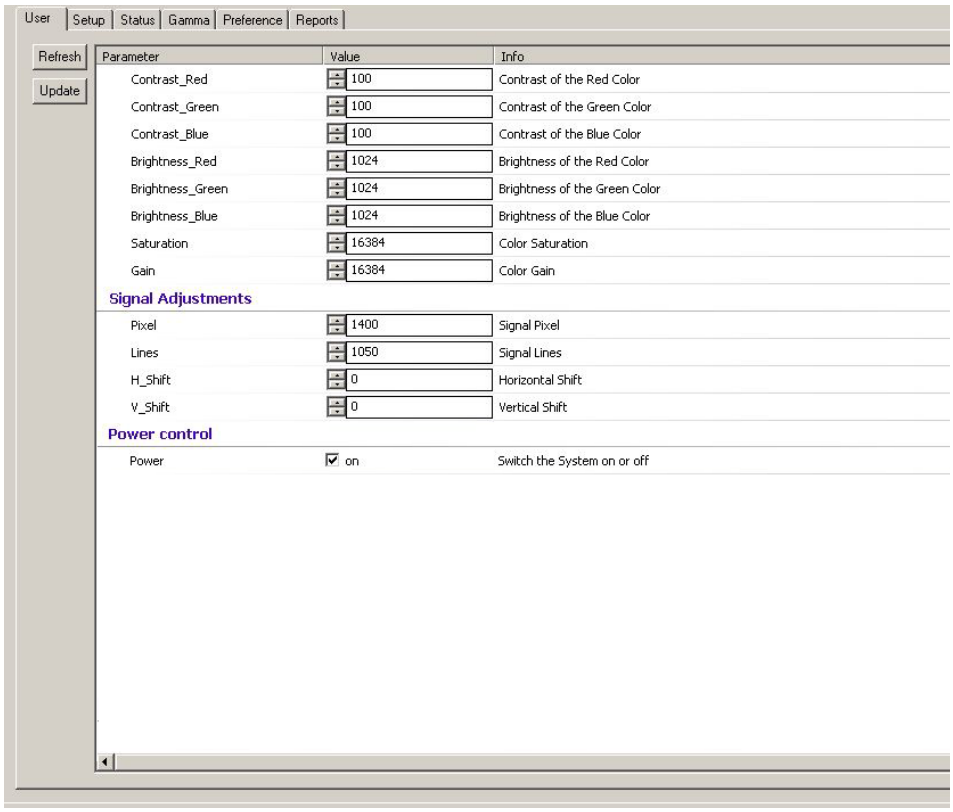
To select several projectors, click and hold the left mouse button and mark the area you wish.

The Parameter area

The settings are displayed and can be changed in this area of the screen.

User

In the **User** menu, you can find parameters for adjusting the colour values,

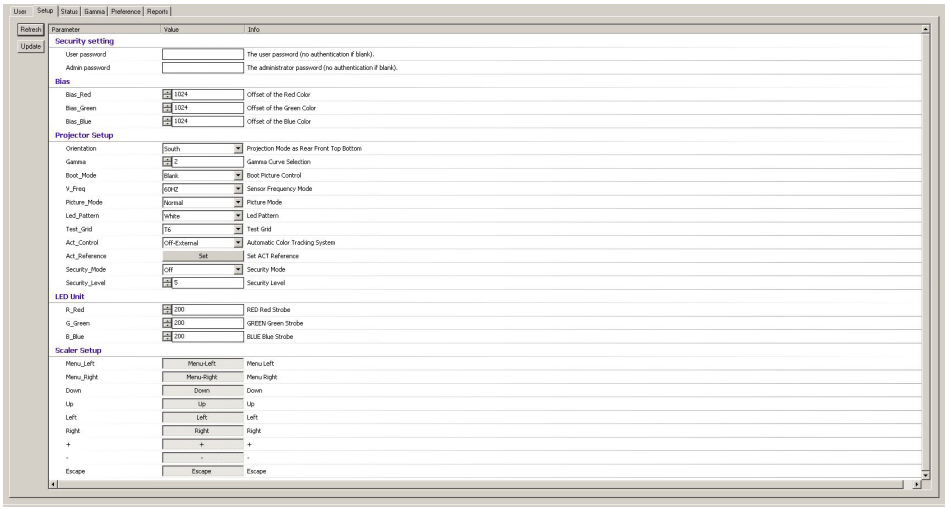


Buttons	**Refresh**	Refreshes the screen content
	Update	Reloads the settings from the projector
Color Adjustment	**Contrast_Red**	Sets the contrast level of red
	Contrast_Green	Sets the contrast level of green
	Contrast_Blue	Sets the contrast level of blue
	Brightness_Red	Sets the brightness level of red
	Brightness_Green	Sets the brightness level of green
	Brightness_Blue	Sets the brightness level of blue
	Saturation	Sets the saturation level of the displayed image
	Gain	Sets the gain level of the displayed image
Signal Adjustment	**Pixel**	Sets the number of horizontal pixels in the active area (horizontal resolution)
	Lines	Sets the number of vertical pixels in the active area (vertical resolution)
	H-Shift	Shifts the displayed image in a horizontal direction
	V-Shift	Shifts the displayed image in a vertical direction

Power Control	**Power**	Activates/deactivates the check box to switch the display on/off.

Setup

The basic password, projector and scaler settings can be performed on this page.



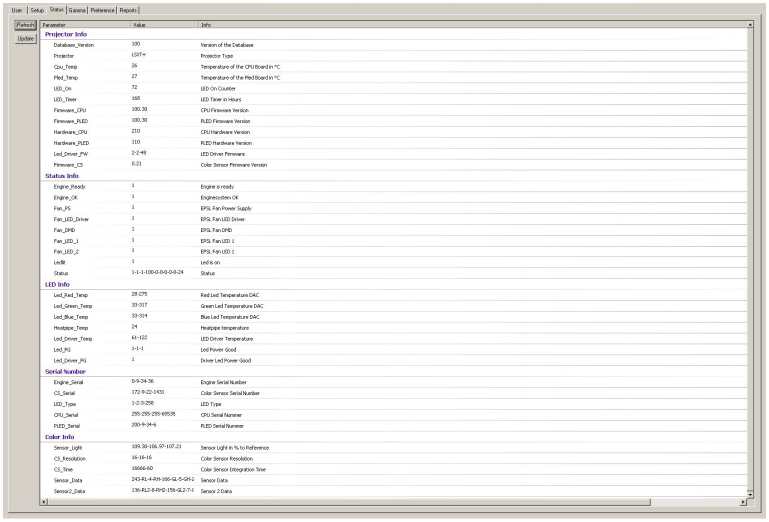
Security Setting	**User password**	Administrators can enter a password for users here when logged in as Admin.
	Admin password	Administrators can change the admin password here when logged in as Admin.
Bias	**Bias_Red**	Sets the basic brightness for red (shifts the brightness curve of the colour)
	Bias_Green	Sets the basic brightness for green (shifts the brightness curve of the colour)
	Bias_Blue	Sets the basic brightness for blue (shifts the brightness curve of the colour)

Projector Setup	**Orientation**	Projection mode for rear/front/ceiling or floor projection
	Gamma	Loads default pre-configured gamma curves. Meaning of values: 0 = Film, 1 = Graphics, 2 = Video, 3 = Linear) **NOTE:** The function is only active if the DIP switches 1+2 = Off.
	Boot Mode	Activates/deactivates the display during the projector startup
	V_Freq	Selects input signal frequency for the colour sensor (50 Hz or 60 Hz signal)
	Picture_Mode	Selects the display mode (shows image, activates freeze, activates blank, activates LED pattern)
	LED_Pattern	Selects the colour of the LED pattern
	Test_Grid	Optional, only available with scaler board. Selects between various test grids.
	ACT_Control	"Automatic Color Tracking" system, activates the internal sensor for colour tracking.
	ACT_Reference	Sets the reference for the "Automatic Color Tracking" after colour adjustment.
	Security_Mode	Activates the "Color Rescue Control" in the event a LED fails: • **Mode 1:** Displays image in black/white mode. • **Mode 2:** Displays image flashing slowly in black/white mode. • **Mode 3:** The missing colour is displayed by a mixture of the remaining primary colours. • **Mode 4:** The missing colour is displayed by a mixture of the remaining primary colours. The image content flashes.
	Security_Level	Sets the level of colour replacement for the Color Rescue Control and flashing frequency of the image (standard = 5/Off = 0/Highest value = 10)
LED Unit	**R_Red**	Manual colour adjustment of red LED
	G_Green	Manual colour adjustment of green LED
	B_Blue	Manual colour adjustment of blue LED
Scaler Setup[2)]	**Menu_Left**	Exits the OSD submenu
	Menu_Right	Opens the OSD submenu
	Down	Navigates down in the OSD menu
	Up	Navigates up in the OSD menu
	Left	Navigates left in the OSD menu
	Right	Navigates right in the OSD menu
	+	Increases the selected value
	–	Decreases the selected value
	Escape	Exits the OSD menu

1) Only available in conjunction with the optionally available scaler.

Status

In this window, you can call up current status information such as errors, temperature, firmware etc.



Projector Info	**Database_Version**	Database version ID
	Projector	Projector type
	CPU_Temperature	Temperature of the CPU board in °C
	PLED_Temperature	Temperature of the PLED board in °C
	LED_on	Number of startup sequences of the LEDs
	LED_Timer	Total operating hours of the LEDs
	Firmware_CPU	Firmware version of CPU board
	Firmware_PLED	Firmware version of PLED board
	LED Driver_FW	Firmware version of LED driver
	Firmware_CS	Firmware version of colour sensor
Status Info	**Engine_Ready**	• 1 = normal mode • 0 = error mode
	Engine_OK	• 1 = normal mode • 0 = error mode
	Fan_PS	• 1 = normal mode • 0 = error mode
	Fan_LED_Driver	• 1 = normal mode • 0 = error mode
	Fan_DMD	• 1 = normal mode • 0 = error mode
	Fan_LED_1	• 1 = normal mode • 0 = error mode
	Fan_LED_2	• 1 = normal mode • 0 = error mode
	Ledlit	• 1 = normal mode • 0 = error mode
	Status	Service code

LED Info	**LED_red_Temp**	Temperature of red LED in °C (first value) / raw parameter (second value)
	LED_green_Temp	Temperature of green LED in °C (first value) / raw parameter (second value)
	LED_blue_Temp	Temperature of blue LED in °C (first value) / raw parameter (second value)
	Heatpipe_Temp	Temperature of heatpipe system in °C
	LED_driver_Temp	Temperature of LED driver in °C (first value) / raw parameter (second value)
	LED_PG	1 = normal mode 0 = error mode
	LED_Driver_PG	1 = normal mode 0 = error mode
Projector Info	**Status info**	Advanced status information for internal use (e.g. for error analysis)
	LED Info	
	Serial Number	Serial number of projector
	Engine_Serial	Serial number of projection engine
	CS_Serial	Serial number of colour sensor
	LED_Type	LED type
	CPU_Serial	Serial number of the CPU board
	PLED_Serial	Serial number of the PLED board
Colour Info	**Sensor_Light**	Reference values in percent (%) for R, G and B
	CS_Resolution	Colour sensor resolution
	CS_Time	Integration time of the colour sensor / frequency of colour sensor
	Sensor_Data	Firmware data for sensor 1
	Sensor2_Data	Firmware data for sensor 2

Gamma

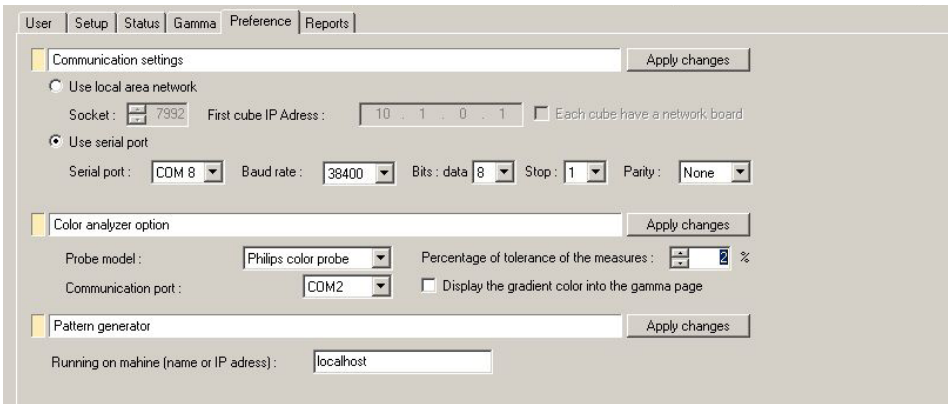
The Gamma program area gives you full control over the gamma curve of the individual colours (red, green, blue).

>) **NOTE:**
> With the new ESP projectors, the "Gamma" program area is less important. The colours of the ESP projectors are now adjusted using the special "EC-Lcontrol" colour adjustment software.

Information on how to work with the colour adjustment software can be found in *The EC-Lcontrol Software* section from page 47 onwards.

Preference

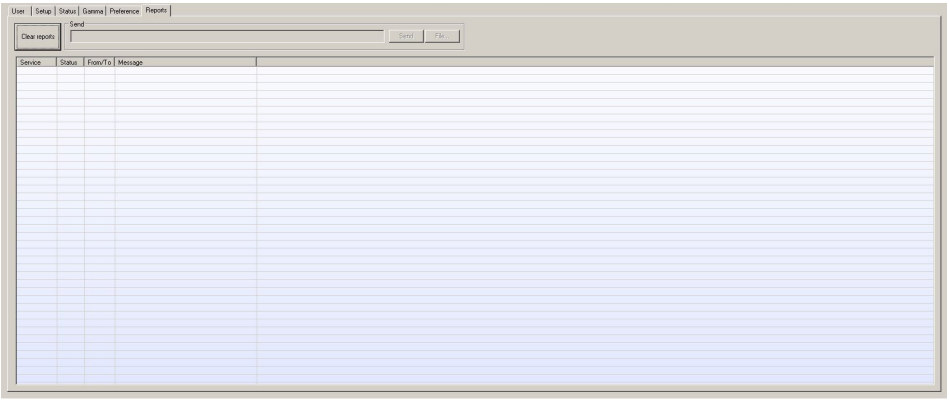
The communication to the first projector is defined on this page. The **Color Analyzer** and pattern generator options can also be set.



Communication Settings	**Use local area network**	**With an Ethernet connection between the PC and the first prjector** • **Socket:** Standard 7992 • **First device IP Address:** IP address of the connected projector (the first projector) • **Each device has a network board:** With an Ethernet connection when each projector has its own network card. • **Apply changes:** Accepts the new settings You can check on the **Reports** page if the connection is active.
	Use serial port	**With an RS232 interface connection between the PC and the first projector** (this is the standard communication gateway) • **Serial Port:** COM port used • **Baud rate:** Standard is 38400 • **Bits:** Standard is data = 8, stop = 1 • **Parity:** Standard is None • **Apply changes:** Accepts the new settings You can check on the **Reports** page if the connection is active.
Color analyzer option	**Probe model**	**These settings are only relevant for UHP projectors (with lamp).**
	Communication port	
	Percentage of tolerance of the measures	
	Display the gradient color into the gamma page	
Pattern generator	**Running on machine (name or IP address)**	

Reports

All software status messages are collected and can be monitored here. Command sequences can also be generated and sent to a projector.



Clear reports		Deletes all reports
Send	**Send**	Sends the command in the **Send** field to the selected projector.
	File	Selects a previously created file from the file directory. The selected file is added to the Send window and can then be sent to the selected projectors by clicking on **Send**.

) **NOTE:**
Only administrators have the authorisation to send commands (logon with password).

Command sequences are used to control the projectors. A separate manual for serial commands is available to show you how to generate command sequences. This can be requested from the eyevis service.

The EC-Lcontrol Software

The EC-Lcontrol program has been specially developed for controlling the colour of the eyevis LED projectors series.

Starting the EC-Lcontrol software

EC_Lcontrol.exe

) NOTE:
The EC-Lcontrol software uses serial interfaces only..

✓ You have created a connection to the first projector.
Use the eyeDevice software (see *The eyeDevice Software* section from page 38 onwards) to set the connection parameters.

1. Open **EC-Lcontrol.exe** to launch the program for the colour adjustment of the video wall.
   ↳ The start page opens.

The start page at a glance

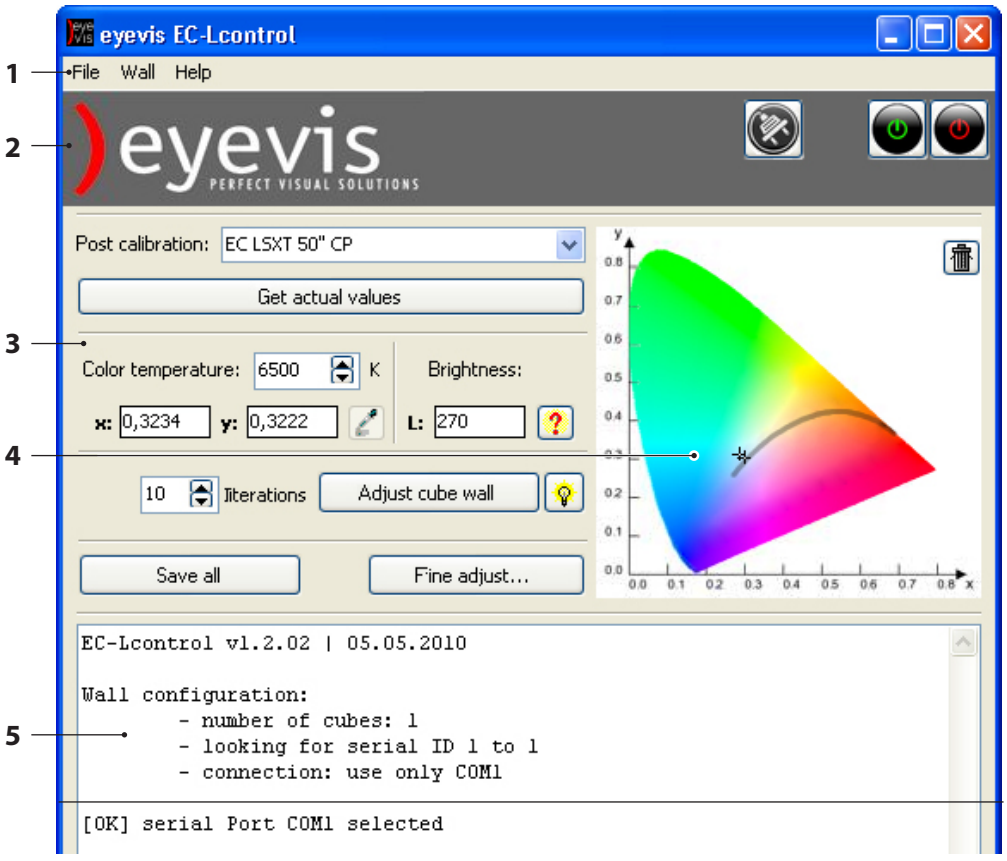


Fig. 13: Start page of the EC-Lcontrol software

1	**Menu bar** • **File:** Closes the program • **Wall:** Projection settings, calibration • **Help:** Calls up the online help
2	**Button bar** Quick access to these functions: Establishes the connection Switches on the entire wall Switches off the entire wall
3	**Setting area** • **Post calibration:** Compares internal values to the actual brightness and colour on the front of the screen. • **Color temperature:** Sets the colour temperature • **Brightness:** Sets the brightness • **Iterations:** Number of iterations for optimisation • **Save all:** Saves all settings • **Fine adjust.:** Fine adjustment of colour values **If no connection is established with the projector, a black cube housing is displayed instead of the setting parameters.**
4	**Colour diagram window** Displays the colour spectrum with the set colour curve Deletes data in the CIE diagram
5	**Status window** Displays the current settings and messages. In the example, the number of projectors connected with the control PC are highlighted blue.

The menu bar (1)

In the menu bar, you have access to all settings and functions.

File > Exit

The program is closed.

Wall > Connect with wall

Establishes the connection to the video wall. The same function is also available with .

Wall > Wall setup

Opens the window for adjusting the connection parameters.

Serial connection to projectors

Serial port	Selects the COM port to which the first projector is connected

Detect connected projectors

Serial port	Selects the COM port request: **Scan all available serial ports:** All serial ports are scanned. **Use only selected serial port:** Only the port entered under **Serial port** is scanned.
	Establishes the connection with the projector
Connected projectors	Enters the IDs from the first and last projector. The IDs are usually set at the input box when commissioning each projector (see *Addressing the projectors* on page 18).
	Advanced functions. Only for users with administrator rights.

Wall > Advanced calibration

Advanced calibration functions. Only for users with administrator rights.

Wall > Picture

Switching the image:

- **Normal (signal):** Normal operation, the signal is reproduced.
- **White:** The screen is switched to white.
- **Black:** The screen is switched to black.

Wall > Get wall status information

Reads the current wall status and saves the results in a text file. Path and file name:
...\EC_Lcontrol\status\status_[Date].txt

Wall > Get wall color calibration information

Reads the information for wall colour calibration and displays it in the display field.

Help > About...

Information on software.

The setting area (3)

Post calibration

Enables the selection of a calibration standard. Once a standard is selected, the values of the standard can be retrieved via the **Get actual values** button.

To use the „Port calibration" function:

1. Open the drop-down menu and select a standard.
   If you select **No post calibration 1:1** no standard is selected and no calibration is performed.
2. Click on the **Get actual values** button.
   ↳ The settings of the selected standard are displayed in the display window.

Color temperature

Adjusting the colour temperature.

The colour temperature can be entered numerically or changed using the arrow keys. When a colour temperature is entered, the CIE values x and y are intuitively adjusted. This point in the CIE coordinates system is referred to as the whitepoint.

The colour temperature is a measurement for the colour rendering of a light source and is represented in the unit [K] Kelvin. Various ambient conditions (daylight, artificial light) display varying colour temperatures. The projection can be adjusted to these ambient conditions.

The table below displays some of the typical colour temperature values:

Tab. 1: Colour temperatures

Candle	1500 K
Bulb	2200 K – 3000 K
Halogen lamp	3000 K
Sun	late evening: 3400 K, morning/evening: 5000 K, am/pm: 5500 K
Daylight lamp	5600 K – 7000 K
Overcast sky	6500 K – 7500 K
Fog, mist	7500 K – 8500 K
Blue on shaded north side	9000 K – 12000 K

Brightness

Setting the brightness

L	Manual input of brightness.
	The software calculates the brightness and the whitepoint based on the current settings of the projection. An average value is calculated from the recorded colour and brightness of all projectors. This option is useful when no explicit whitepoint or colour temperature is required.

Iterations / Adjust cube wall

Optimising the brightness settings.

Iterations	Number of iterations for optimising the settings.
Adjust cube wall	After clicking on the button, the optimisation is performed with the number of iterations listed under **Iterations**. The progress of the optimisation is shown in the display window.
	Resets all projectors to maximum brightness.

Save all

All the settings made in the setting area are saved in all projectors.

Fine adjust...

Fine adjust is used to finely adjust the colour values. Click on the button to open a new window:

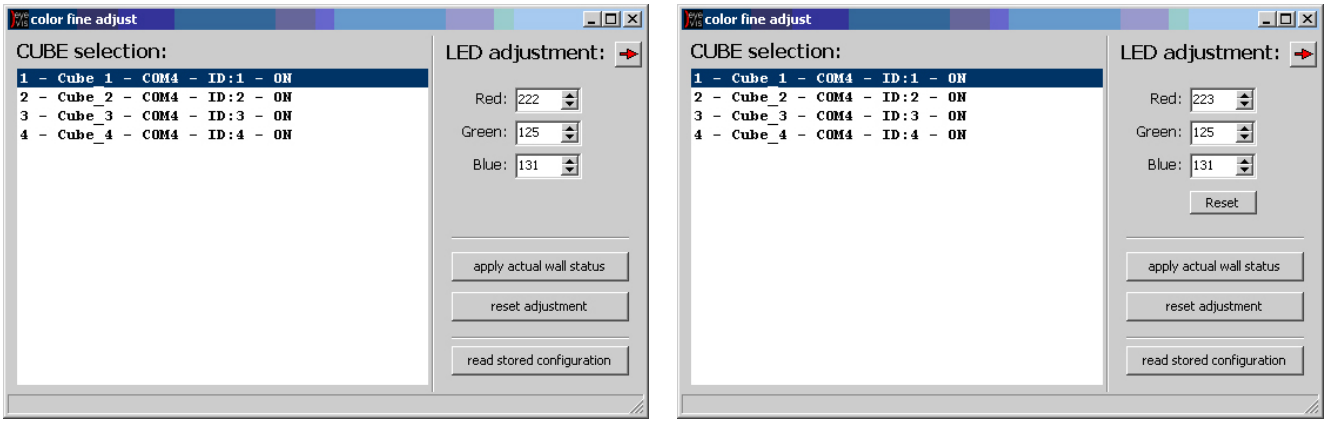

color fine adjust
CUBE selection:
1 - Cube_1 - COM4 - ID:1 - ON
2 - Cube_2 - COM4 - ID:2 - ON
3 - Cube_3 - COM4 - ID:3 - ON
4 - Cube_4 - COM4 - ID:4 - ON
LED adjustment:
Red: 222
Green: 125
Blue: 131
apply actual wall status
reset adjustment
read stored configuration
color fine adjust
CUBE selection:
1 - Cube_1 - COM4 - ID:1 - ON
2 - Cube_2 - COM4 - ID:2 - ON
3 - Cube_3 - COM4 - ID:3 - ON
4 - Cube_4 - COM4 - ID:4 - ON
LED adjustment:
Red: 223
Green: 125
Blue: 131
Reset
apply actual wall status
reset adjustment
read stored configuration

Fig. 14: Fine adjustment: view without CIE window, left without RGB deviations, right with RGB deviations (reset button is visible)

CUBE selection

Selects the desired projectors.

LED adjustment

Input the RGB values and apply as CIE offset.

> **NOTE:**
> Each projector has its own internal colour sensor calibrated in the factory. To attain a precise colour homogeneity of a projection, it can sometimes be necessary to adjust the colours of individual segments. The calibration can be refined by allocating offset values to the colour point of individual projectors. These offsets are permanently saved and used for every colour adjustment. They are not only valid once for the current colour but as general correction values for the internal sensor.

Red **Green** **Blue**	Direct input of RGB values
Apply actual wall status	After the desired values are entered, all offsets and brightness values are transferred to the selected projector(s). The projectors are then adjusted accordingly to immediately check the new entries.
Reset adjustment	Deletes all the set but not saved offsets under **LED adjustment** or **CIE adjustment** for all projectors. The offsets that are stored on the projectors are not deleted. By resetting the values, the fine calibration can be restarted.
Read stored configuration	Restores the last offsets stored in the projector. Unwanted or defective settings can be reset in this way.
Reset	Resets the changes made under **Red/Green/Blue**.
→	Opens the window for entering the CIE values.

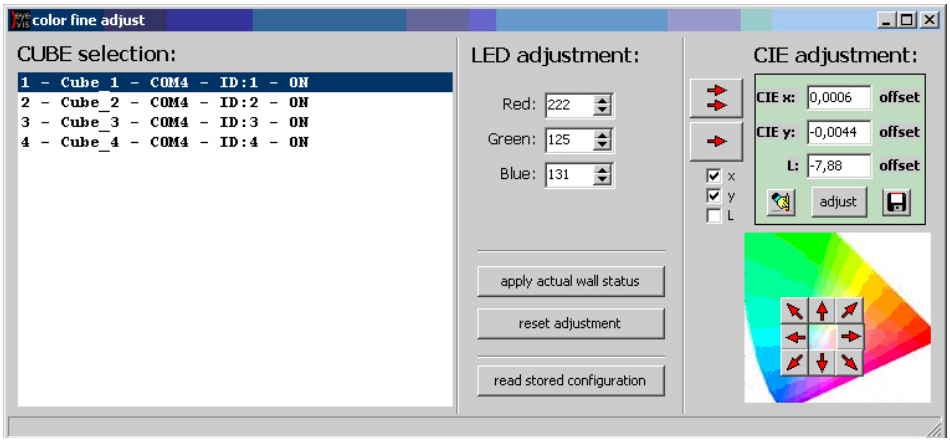


Fig. 15: Fine adjustment with CIE window

CIE adjustment

Setting the CIE offset either by applying the RGB values, entering numerical figures or by changing settings in the colour field.

⇉	Applies the RGB values to all projectors.
→	Applies the RGB values only to the projector selected in **CUBE selection**.
x **y** **L**	Selects the CIE parameters which should be changed by the RGB input.

CIE x **CIE y** **L**	Display and numerical input of offsets.
	Resets all offsets to 0.
Adjust	Transfers the offsets to the selected projector.
	Saves the offsets.

Colour field

Click on the arrow buttons to shift the colour point in the colour field. The changes are displayed directly in the CIE fields.

Working with CIE adjustment and colour field

You have already learned how to change the RGB values in the *Fine adjustment for selected projectors* section on page 27. You will find out below how to change the CIE values directly or via the colour field.

► Click on the symbol to open the advanced **CIE adjustment** window and select the projector you want to adjust from the list in the left-hand field.

You have the following input options:

- Drag the whitepoint across the colour field
- Enter the RGB values directly
- Enter the CIE values directly

Drag the whitepoint across the colour field:

1. With the arrow buttons in the colour space, you can shift the whitepoint in the direction you want.
   ↳ The effects on the x, y and L values are displayed immediately.
2. Click on **Adjust** to transfer the settings to the selected projector.

Enter the RGB values directly:

1. Manually enter the values for Red, Green and Blue.
2. Transfer the values into the CIE section by proceeding as follows:
   a. Checkmark the boxes for x, y and L to determine which values should be changed.
   b. Click on the button to apply the settings for all projectors.
   c. Click on the button to apply the changes for the selected projector.
3. Click on **Adjust** to transfer the settings to the selected projector.

Enter the CIE values directly:

1. Manually enter the values for **CIE x**, **CIE y** and **L**.
2. Click on **Adjust** to transfer the settings to the selected projector.

Complete the entry and then save:

1. Close the **Color fine Adjust** window.
2. Press the **Save all** button in the start window.

Warranty Terms and Conditions

Duration and validity of warranty

The specified product is under warranty for 24 months beginning from the date of delivery by eyevis GmbH.

Warranty services during the warranty period do not extend the validity period of the warranty.

This warranty applies to products that were purchased in the European Union. Warranty services can only be claimed in these countries.

The sales agreement or the invoice (original invoice with serial number) of the first purchaser must be presented as proof of purchase to claim warranty services. If the customer cannot provide this evidence of purchase, the warranty period is dated back to the date of purchase at the specialist supplier (first supplier) plus one month.

Warranty

If the product shows any faults or defects during the warranty period, eyevis GmbH provides the following services in compliance with the warranty:

- **Exchange of defective parts by the customer**
- **Device repair at eyevis**
- **On-site device repair by eyevis**

The choice of services depends on each particular warranty case and must be arranged with eyevis before commissioning.<GT>

Warranty disclaimers

Non-accountable errors and defects

This warranty only covers malfunctions caused by material damage and/or faulty workmanship on a product that was distributed by eyevis GmbH. The warranty therefore excludes faults and defects beyond the responsibility of eyevis GmbH, particularly in cases of:

- Improper use, mechanical damages (e.g. marks caused by scratches, pressure or breakage), incorrect storage or cleaning, transport damages, misuse or any other reason the customer or a third party is responsible for, especially if the instructions contained in this user manual are not adhered to.
- Display damages caused by continuous display of freeze images (or part freeze images).
- Failure or fluctuations of the electrical power supply or the electric circuit, the air-conditioning system or other external factors.
- Unusual operating conditions including operation in areas with smoke (from cigarettes etc.) and dust.
- Force majeure, fire, flooding, chemical or biological factors, war and violence or other similar events.
- Any kind of defect and fault on accessory parts and components (even if they were supplied by eyevis GmbH) are not an integral part of the product that is covered by this warranty.
- Any attempts to adjust, modify, install or retrofit the product or services rendered to the product by a person not authorised by eyevis GmbH.

Accessories, boxes, batteries and other parts

Accessory parts such as boxes, packaging, batteries and other parts, which are used together with this product and which you would expect to have to replace, are not covered by the warranty.

Missing, modified or damaged serial numbers

If a product's serial number is damaged, modified or removed, it will no longer be covered by this warranty.

Recommended procedure for liability claims

Refer to the *Malfunctions and Troubleshooting* section from page 34 onwards and check if the problem could be rectified on-site before claiming for a warranty service.

If the problem continues, the customer should claim for support from his/her regional eyevis GmbH partner. Please have the following information ready:

- Product ID and serial number of the device
- A description of the problem
- Pick-up address and contact information
- Date and place of purchase
- A description of the required service work

Once the device's faults and damages have been analysed, eyevis GmbH shall accept the warranty claims if the necessary conditions have been fulfilled. The customer shall receive a service code and eyevis GmbH will perform the service work requested by the customer. The customer shall be obliged to have the product ready for collection (in cases of DOA, the product must be equipped with all cables and mains adapters before it is packaged into the box). If the customer fails to have the device ready for collection, he/she shall be obliged to bear the costs for the replacement device.

eyevis GmbH can provide a suitable transport box on request if the customer cannot ensure that the device is packaged correctly and labelled as breakable goods. The customer shall be liable for damages caused by the use of improper and unsuitable packing by the customer.

The customer shall be responsible for arranging the transport of the display to eyevis GmbH.

The customer shall have his/her service code ready for any further contacts with eyevis GmbH concerning this warranty claim.

eyevis GmbH shall reserve the right to invoice the customer for costs incurred by complaints made about defects or faults that are not covered by this warranty.

Legal and other claims

No other express or implied warranties, representations or conditions are available other than those stated in this warranty. Other legal or contractual claims, even those made to the supplier of the product, are excluded as far as eyevis GmbH has provided the service based on this warranty.

This warranty does not affect nor has influence on other legal warranty claims or other contractual claims between the customer and the supplier of the product. These claims can be made independently to the claims referred to in this warranty document.

Limitation of liability

In cases of minor negligent breaches of duty, the liability of eyevis GmbH is limited to direct, foreseeable and contractual-specific average damages. The slight negligent breach of minor contractual obligations excludes liability cliams. In the event that the liability of eyevis GmbH shall be excluded and limited, this shall also apply to the personal compensation liability of its employees, staff, associated employees, agents and auxiliary personnel. The preceding limitations of liability do not apply to the customer's claims derived from the Product Liability Act and to claims concerning damages to the body or health or in the case of the loss of life of the customer.

Technical Specifications

General technical specifications

Description	Digital DLP® projector for video and data display
Brightness:	ca 600 ANSI lumens, depending on the color temperature
Contrast ratio:	1.800:1 (full on / full off). Up to 10.000:1 or more with dynamic contrast.
Illumination	≥ 95%
Input singnal:	1 DVI
Dimensions (B x H x T):	617,5 x 287,5 x 256 mm
Weight:	ca. 13.5 kgs (without optics)
Power consumption:	250 Watt @ 110/240 VAC
LED Life:	60.000 hrs (under certain operating conditions)
Software:	eyevisDeviceManager / EC-Lcontrol

ESP-LXT

Resolution:	1024 x 768 Pixel (XGA)

ESP-LSXT+

Resolution:	1400 x 1050 Pixel (SXGA+)

ESP-LHD

Resolution:	1920 x 1080 Pixel (full HD)

ESP-LWXT

Resolution:	1920 x 1200 Pixel (WUXGA)

Environmental conditions

Environment temperatures:	• In operation: +5 °C – +35 °C (with Seamless Screen: +18 °C – +25 °C) • When stored: 0 °C – +50 °C
Air humidity:	0% – 80% noncondensing
Height:	0 – 3000 m
Noise	≤ 36 dB

Options

Service and maintenance contracts